User Centric Mapping for Car Navigation Systems

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Outline

• Motivation
• Proposed Approach
• Implementation
• Results
• Conclusion and Future Works
Limitations for line selection

Maps with static content
Motivation

Accuracy of the communicated information.

Accuracy of the road network: level of generalisation
Accuracy of related areal data: landuse determination
Outline

- Motivation
- **Proposed Approach**
- Implementation
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Proposed Approach

Proposal of a user centred approach for navigation oriented generalization

- The aim of the study is to derive car navigation maps from the base data not only automatically, but also user centrically.
  - Perspective representations of most detailed level of navigation process in terms of content
    - generalized user centrically
    - more accurate presentations

Proposed Approach

Land use determination and network simplification
Land Use Determination

1st Representation Level
- Base Map

2nd Representation Level
- Classified Representation
- Perspective Representation

Commonly Used Method
- Perspective Representation Base Map

Proposed Approach
- Perspective Representation Base Map
Land Use Determination

Commonly Used Method

Proposed Approach

1st Representation Level

Base Map

2nd Representation Level

Previous Route

New route
Land Use Determination

Commonly Used Method

Proposed Approach
Why Network Simplification?

Commonly Used Method

Proposed Method
How We Simplify?
Outline

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Implementation...

Data: (Study area Besiktas):
- Navigable road network
- Areal data (Buildings)
- Related attribute data

Platform: Geoxygene
Implementation...

User Centric Mapping

Preprocessing & Data Enrichment

<Datastore>
Level 1
- Line (Road)
- Area (Building)

<Datastore>
- Buildings
- Classified Blocks
- POIs
- Potential Landmarks
- Areas
- Nodes

Route Dependant Process

<Datastore>
- Faces
- Derived Blocks
- Basic Units
- POIs
- Landmarks
- Areas
- Selected Areas

[Maps and diagrams related to the above described process]
Outline

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Sample Results of Areal Process...

Base data  Commonly used method  Proposed method
Sample Results of Areal Process...

Commonly used method

Proposed method
Sample Results of Areal Process…

- Base data
- Commonly used method
- Proposed method
Sample Results of Areal Process

Commonly used method

The map used in a commercial system

Proposed method
Sample Results of Linear Process...

Base data

Commonly used method

Proposed method
Sample Results of Linear Process

- Base data
- Commonly used method
- Proposed method
Sample Results of Linear Process

Base data

Commonly used method

Proposed method
Outline

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Conclusion and Future Works….

- A method including:
  - Road network generalization
  - Areal generalization based on attributes implemented.

- Navigation systems
  - Realtime navigation
    - User-centric mapping
    - Perspective view
    - 3D Navigation

Future work: Evaluation of results by means of usability and efficiency
Thanks for your interest...

Questions?

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Discussion Time 😊